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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/001,518	10/30/2001	Stephen B. Johnson	01-645	2573

7590 06/30/2004

LSI Logic Corporation
Corporate legal Department
Intellectual Property Services Group
1551 McCarthy Boulevard, M/S D-106
Milpitas, CA 95035

EXAMINER

FLEMING, FRITZ M

ART UNIT PAPER NUMBER

2182

DATE MAILED: 06/30/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/001,518	Applicant(s) JOHNSON, STEPHEN B.	
	Examiner Fritz M Fleming	Art Unit 2182	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-27 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.


 FRITZ FLEMING
 PRIMARY EXAMINER
 GROUP 2100

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 October 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-3 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Steeby.

In Steeby, please note: measuring a temperature in a device (50,18,36),

Comparing the temperature to a first threshold (52,56),

Decreasing the throughput of the device (12,12') if the temperature exceeds the first threshold (58,60), as throughput is decreased when the frequency is decreased. Note that when the frequency is decreased, there is also a corresponding limit set to the number of requests that can be processed in a given time period, as a given clock frequency will allow a fixed number of requests to be serviced during any given time period.

3. Claims 1-3 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Ang.

In Ang, please note: throughput is addressed in column 2, lines 51-68 such that a decrease in temperature is linked to a decrease in the number of ops required per data. Also note that the device is shown in Figure 2, such that a temperature is measured at 102, the temperature compared to a threshold at 104, such that throughput is

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decreased upon exceeding the threshold at 106. Clock frequency reduction is mentioned at column 4, lines 20-22. Throughput is decreased by setting a limit to the number of requests to be processed in a given time period, as ANG switches to decreased throughput scenarios based upon 106, also noting that throughput can be increased in 110.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 4,5,10-17,22-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ang in view of Mittal et al. (Mittal).

Ang is discussed initially above, pertaining to claims 1-3. However, in claims 4+, it is required that a determination of a request limit having been reached be made, with processing to continue if the limit has not been reached. In review, Ang clearly shows that temperature is measured at 102, clearly in response to the expiry of a predetermined wait time at 108, which is tantamount to a timer interrupt. Temperature is measured at 102, in a data transfer device/data processing device 202, and compared to at least a first temperature range of 104, and a setting of a request limit to SCEN:=1 if the temperature threshold is within a first range and not exceeded, which then warrants the reduction of throughput via incrementing of the SCEN to include less intensive processing. Below a first threshold is Tref and the first value is SCEN:=1. A

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first/second value of "0" is set forth by Ang, by putting the processor on hold, per column 4, lines 20-22. An embedded I/O controller is seen in Ang's use in a video server, column 3, lines 7-12. The method is performed by a control processor 206/202. A temperature sensor is explicitly shown at 204, as is the control processor 206/202. The ultimate use is in a computer program product.

Mittal shows the missing teaching, that being the use of an activity level on which to decrease throughput. The activity monitor 106 monitors recent utilization of the unit 105, which is in response to a data transfer request in the form of the current activity 108 describing a current task or operation. If the activity level 109 exceeds a threshold, then unit 105 is placed into a reduced power mode in a throttling condition, which is a lowering of instruction rates per column 3, lines 14-17. It is suggested to use this strategy in combination with a clock rate reduction (column 7), or in conjunction with temperature monitoring (column 5, lines 30-42).

Therefore, it would have been obvious to one having ordinary skill in the art at the time that the invention was made to modify the teachings of Ang by the teachings of Mittal so that better temperature control can be achieved, by not only checking actual temperature to determine decreased throughput, but by also checking the actual activity level to a threshold determined by the temperature, and adjusting the throttling in response thereto. Thus, during a data transfer request, it is seen that a determination is made if an activity level has been exceeded, and if so, throttling is effected. If the activity level has not been exceeded, then processing is continued. As pointed out above, combination is explicitly taught by Mittal. Regarding claim 11, it is to be noted

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that the combined teachings teach an iterative approach, based upon the above analysis in that the activity level is constantly updated, to include the incrementing and decrementing of Mittal at 205,304,305 as the whole point is to reduce temperature by monitoring an activity level against a threshold, so during operations, a request limit is effectively decremented, as an activity level is an on going equivalent mechanism.

Regarding claim 14, Mittal suggests the use of lower speed off chip circuits, column 7, lines 51-58.

6. Claims 6-9,18-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ang in view of Mittal as applied to claims indicated above, and further in view of Steeby.

Ang in view of Mittal lack the finer granularity of temperature ranges and thresholds.

Steeby shows the use of finer granularity via multiple thresholds and frequencies per Figure 3. Thus it is clearly taught to use multiple thresholds and levels (52,54,56,58,60) to better control temperature.

Therefore it would have been obvious to one having ordinary skill in the art at the time that the invention was made to modify Ang and Mittal in view of Steeby, so that finer granularity can be achieved by the use of multiple temperature thresholds and ranges to determine which level of throttled process activity is appropriate. It is clear that in such an approach, better temperature regulation is achieved by linking a request/activity level to multiple temperature ranges. As the SCEN of Ang is changed at 106, it is clear that the request limit is lowered, and when modified per Steeby, the appropriate SCEN is linked to an appropriate threshold.

Double Patenting

7. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

8. Claims 1-27 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-28 of copending Application No. 09/969,377 in view of Ang, Mittal and Steeby, as set forth above in detail. Although the conflicting claims are not identical, they are not patentably distinct from each other because the co-pending claims set forth the nature of I/O requests and clock frequency adjusting as well as a plurality of processors linked to the number of requests and the adjusting of such. What is missing is the linking of such to the temperature. Thus, when combined with Ang, Mittal and Steeby, the instant claimed subject matter is rendered as an obvious variant of the co-pending claimed subject matter.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Conclusion

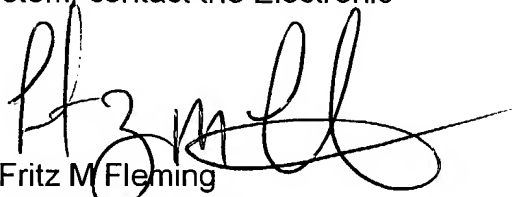
9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. WO 92/10032 is discussed by Ang. US006564328B1 teaches a decreased instruction throughput at 550. US005590061A teaches the use of threshold at 202. US005825674A teaches thermal comparison at 140, as does US005745375A. US005881298A teaches thresholds at 210 and 212. US006535984B1 teaches nops. US006535798B1 teach throttling at 314. US006415388B1 teaches range at 320. US006336080B1 teaches thermistor 16 and thermal management based thereon. US005723998A teaches temperature setting at 5. US005502838A teaches the use of multiple processors 55+. US005832284A teaches multiple units 34. US005752011A teaches clock frequency slowing based on temperature. US006751741B1 teaches clock mode settings at 16. US006718474B1 teaches multiple processor temperature regulation.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Fritz M Fleming whose telephone number is 703-308-1483. The examiner can normally be reached on 9-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jeffrey Gaffin can be reached on 703-308-1483. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Fritz M Fleming
Primary Examiner
Art Unit 2182

fmf